

DEPARTMENT OF TRANSPORTATION**DIVISION OF ENGINEERING SERVICES**

Transportation Laboratory

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**METHOD OF TEST FOR SLUMP OF
FRESH PORTLAND CEMENT CONCRETE****A. SCOPE**

This test method, which is a modification of ASTM C143 and AASHTO T-119, is intended to provide the user with a procedure to determine the slump of plastic portland cement concrete.

This method is considered applicable to plastic concrete having coarse aggregate up to $1\frac{1}{2}$ in. in size. If the coarse aggregate is larger than $1\frac{1}{2}$ in., the test method is applicable when it is made on the fraction of concrete passing a $1\frac{1}{2}$ in. sieve, with larger aggregate being removed by wet sieving procedures.

This test method is not considered applicable to non-plastic and non-cohesive concrete.

Concrete having a slump less than $\frac{5}{8}$ in. may not be adequately plastic, and concrete having a slump greater than 9 in. may not be adequately cohesive for this test to have significance. Caution should be exercised in interpreting such results.

B. REFERENCES

ASTM C 143 - Slump of Hydraulic-Cement Concrete

AASHTO T-119 - Test for Slump of Hydraulic-Cement Concrete

California Test 539 - Sampling of Fresh Concrete

C. APPARATUS

1. **Mold** - The test specimen shall be formed in a mold made of metal not readily attacked by the cement paste. The metal shall not be thinner than 0.06 in. and, if formed by the spinning process, there shall be no point on the mold at which the thickness is less than 0.045 in. The mold shall be in the form of the lateral surface of the frustum of a cone with the base 8 in. in diameter, the top 4 in. in diameter, and the height 12 in. Individual diameters and heights shall be within $\frac{1}{8}$ in. of the prescribed dimensions. The base and the top shall be open and parallel to each other and at right angles to the axis of the cone. The mold shall be provided with foot pieces. The mold shall be constructed without a seam. The interior of the mold shall be relatively smooth and free from projections or dents. A mold that clamps to a nonabsorbent base plate is acceptable provided the clamping arrangement is such that it can be fully released without movement of the mold.
2. **Tamping Rod** - The tamping rod shall be a round, straight steel rod $\frac{5}{8}$ in. in diameter and approximately 24 in. in length, having the tamping end rounded to a hemispherical tip the diameter of which is $\frac{5}{8}$ in.

D. SAMPLE

The sample of concrete from which test specimens are made shall be representative of the entire batch. It shall be obtained in accordance with California Test 539, Method of Sampling Fresh Concrete.

E. PROCEDURE

1. Dampen the mold and place it on a flat, moist, nonabsorbent (rigid) surface. The operator standing on the two foot pieces shall hold it firmly in place during filling. Using the sample of concrete obtained, immediately fill the mold in three layers, each approximately one-third the volume of the mold.
2. Rod each layer with 25 strokes of the tamping rod. Uniformly distribute the strokes over the cross section of each layer. For the bottom layer, this will necessitate inclining the rod slightly and making approximately half of the strokes near the perimeter and then progressing with vertical strokes spirally toward the center. Rod the bottom layer throughout its depth. Rod the second layer and the top layer each throughout its depth so that the strokes just penetrate into the underlying layer.
3. In filling and rodding the top layer, heap the concrete above the mold before rodding is started. If the rodding operation results in subsidence of the concrete below the top edge of the mold, add additional concrete to keep an excess of concrete above the top of the mold at all times. After the top layer has been rodded, strike off the surface of the concrete by means of a screening and rolling motion of the tamping rod. Remove concrete from the area surrounding the base of the slump cone to preclude interference with the movement of slumping concrete.
4. Remove the mold immediately from the concrete by raising it carefully in a vertical direction. Raise the mold a distance of 12 in. in 5 ± 2 s by a steady upward lift with no lateral or torsion motion. Complete the entire test from the start of the filling through removal of the mold without interruption and complete it within an elapsed time of $2\frac{1}{2}$ min.
5. Immediately measure the slump by determining the vertical difference between the top of the mold and the displaced original center of the top surface of the specimen. If a decided falling away or shearing off of concrete from one side or portion of the mass occurs (see Note), disregard the test and make a new test on another portion of the sample.

NOTE: If two consecutive tests on a sample of concrete show a falling away or shearing off of a portion of the concrete from the mass of the specimen, the concrete probably lacks necessary plasticity and cohesiveness for the slump test to be applicable.

F. REPORT

Record the slump in terms of inches to the nearest $\frac{1}{4}$ in. of subsidence of the specimen during the test.

G. HEALTH AND SAFETY

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to

handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

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(California Test 556 contains 3 pages)**